waring, in damp situations amongst decaying leaves and sticks. There is, however, nothing remarkable in this difference of habit; for the common eft of Europe is not unfrequently to be found on dry land at some distance from water under logs of wood, there being no necessity for the Urodelous Amphibia, after they have passed through that stage of their existence during which they are provided with external gills for aquatic respiration, to keep to the water. The entire order of tailed Amphibia is confined to the temperate parts of the northern hemisphere; but two species have already been described from countries the fauna of which is largely leavened by Indo-Malayan forms,—*Cynops chinensis* having been recorded from near Ningpo, and *Plethodon persimilis* from Siam. This occurrence of a newt within the limits of the Oriental region is far from being without a parallel in other groups of animals also—*Nectogale* (*vide* W. T. Blanford, P. A. S. B. 1876), *Anurosorex*, probably also *Crossopus*, and a host of animals, vertebrate and invertebrate, extending still further southwards, being only to be looked upon as stragglers from the Palæarctic region or as outposts of it, to use the happy phrase of Dr. Günther. The only other form of newt at all resembling *T. verrucosus*, in which horny matter, accumulated at the points where the ends of the ribs press against the external integument, forms on each side of the middle line of the body along the upperside of the flanks a conspicuous row of great rough horny tubercles, is *Pleurodeles*, in which these bosses are sometimes so highly developed as to have given rise to the incorrect notion that the ends of the ribs projected freely through the skin.—*Proceedings of the Asiatic Society of Bengal*, February 1877.

On the Value of certain Arguments of Transformism derived from the Evolution of the Dentary Follicles in the Ruminants. By M. V. Pietkiewicz.

In a communication made to the British Association in 1839, Goodsir announced that he had discovered in the jaw of the calf and lamb the germs of incisors and canines, and even of a molar, intermediate between the abortive canine and the molars which normally exist in those animals. Geoffroy Saint-Hilaire had previously described abortive dentary germs in the lower jaw of *Balæna mysticetus*. The naturalists, and the partisans of the theory of transformism, Darwin especially, grasped at this idea, which, in conjunction with data furnished by comparative anatomy and palæontology, enabled groups of animals previously separated to be brought into relation.

Thus the dental formula of the ordinary Ruminants is I. $\frac{0}{3}$, C. $\frac{0}{1}$, M. $\frac{6}{6}$, and that of the omnivorous Pachyderms (such as the wild boar and the hippopotamus) I. $\frac{3}{3}$, C. $\frac{1}{1}$, M. $\frac{7}{7}$. But two or three genera of Ruminants possess upper canines; and their formula is I. $\frac{0}{3}$, C. $\frac{1}{1}$, M. $\frac{6}{6}$; and the camels and llamas have, in addition, a pair

of very distinct upper incisors, giving them the formula I. $\frac{1}{3}$, C. $\frac{1}{1}$, M. $\frac{6}{6}$. According to M. Paul Gervais these last when young have two pairs of upper incisors, one of which has disappeared in the adult; the young animals would have the formula I. $\frac{2}{3}$, C. $\frac{1}{1}$, M. $\frac{6}{6}$. M. Gervais does not doubt that at a still earlier age a third pair of upper incisors might be found in these animals, the dental formula of which would then be the same as that of the Pachyderms, less one molar, viz. I. $\frac{3}{3}$, C. $\frac{1}{1}$, M. $\frac{6}{6}$.

The *Dinotheria* and *Amphitraguli*, the latter regarded as Ruminants allied to the chevrotains, have seven molars—that is to say, the same number as the Pachyderms. Thus among the Ruminants fossil species were already known having the same dental formula as the Pachyderms, and living species of which the formula was almost identical; and Goodsir's discovery, giving the ordinary Ruminants at a certain age the same formula as the Pachyderms, enabled the two groups to be approximated. Here was one of the results of the hypothesis of the unity of plan in nature, or a confirmation of the transformist theory, the abortion of the organs being explained by their disuse and the gradual establishment of this anomaly by adaptation and heredity.

The author says that, wishing to verify an opinion which enjoyed so much credit in science, he was surprised to find nothing to justify it. In a long series of preparations from embryos of cattle and sheep, from the earliest period of embryonic life up to the time when the fœtus is 30 centims. long in the sheep, he was never able to ascertain the presence of follicles, nor even of any trace of the *epithelial lamina*, the commencement of all follicular development.

Goodsir's error arose from the false idea he entertained of the development of the follicles; and, in fact, at the commencement of his researches, the author fell into the same error himself. In sections made quite at the anterior part of the upper jaw in the ox and sheep, there is on each side of the median line an epithelial sac which separates from the mucous membrane of the mouth to bury itself in the jaw. The mucous layer of Malpighi, uninterrupted, forms its outer covering; whilst in its interior there is a polyhedral epithelium in every respect like that of the middle layers of the buccal epithelium. Thus formed, this little sac would seem to constitute the commencement of the follicle; but by making sections of the same jaw further and further from the front, the little sac is seen to lose its relations with the buccal mucous membrane, and acquires the form of a circular canal, approximating to the mucous membrance of the nasal fossæ. Soon a cartilaginous tube appears round this canal; and then a ridge containing vessels is formed at its upper part. It is Jacobson's organ as described by Gratiolet.—*Comptes Rendus*, March 12, 1877, p. 508.